103d Congress
1st Session

COMMITTEE PRINT

No. 5

INTELLIGENCE SUCCESSES AND FAILURES IN OPERATIONS DESERT SHIELD/STORM

REPORT

OF THE

OVERSIGHT AND INVESTIGATIONS SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

AUGUST 16, 1993

U.S. GOVERNMENT PRINTING OFFICE
71-430 CC WASHINGTON : 1993

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-041383-4

OVERSIGHT AND INVESTIGATIONS SUBCOMMITTEE

NORMAN SISISKY, Virginia, *Chairman*

JOHN M. SPRATT, JR., South Carolina
JOHN S. TANNER, Tennessee
GLEN BROWDER, Alabama
CHET EDWARDS, Texas
DON JOHNSON, Georgia
FRANK TEJEDA, Texas
DAVID MANN, Ohio
JANE HARMAN, California
TIM HOLDEN, Pennsylvania

JAMES V. HANSEN, Utah
JON KYL, Arizona
JOEL HEFLEY, Colorado
JOHN M. McHUGH, New York
TERRY EVERETT, Alabama
ROBERT K. DORNAN, California

WARREN L. NELSON, *Professional Staff Member*
ARCHIE D. BARRETT, *Professional Staff Member*
ROBERT S. RANGEL, *Professional Staff Member*
CHRISTOPHER A. WILLIAMS, *Professional Staff Member*

LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
Washington, DC, August 16, 1993.

Hon. RONALD V. DELLUMS,
Chairman, Committee on Armed Services,
House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: Enclosed is a report of the Oversight and Investigations Subcommittee entitled, "Intelligence Successes and Failures in Operations Desert Shield/Storm." The report was approved without objection by the Subcommittee Members. This report is a supplement to the report issued in April 1992 entitled, "Defense for a New Era: Lessons of the Persian Gulf War."

I shall appreciate your early approval of the report so that it may be printed.

Sincerely,

NORMAN SISISKY, *Chairman,*
Oversight and Investigations Subcommittee.

Enclosure.

Approved for printing:
RONALD V. DELLUMS.

Accession Number: 4788

Publication Date: Aug 16, 1993

Title: Intelligence Successes and Failures in Operations Desert Shield/Storm

Corporate Author Or Publisher: U.S. House of Representatives Committee on Armed Services, Washington, Report Number: 103rd Congress, Com. Print #5

Comments on Document: Report of the Oversight and Investigations Subcommittee of the Committee on Armed Services, House of Representatives, One Hundred Third Congress, First Session

Descriptors, Keywords: Intelligence Success Failure Operation Desert Shield Storm National System Tactical JSTARS ASARS UAV SIDS Damage Assessment Saddam NBC Iraq Persian Gulf War CNN

Pages: 00030

Cataloged Date: Dec 02, 1993

Document Type: HC

Number of Copies In Library: 000001

Record ID: 28427

CONTENTS

INTRODUCTION

Professionals commonly divide intelligence into three broad categories—collection, distribution and analysis. Using those divisions, one can draw some broad overall conclusions:

- Intelligence *collection* in Operation Desert Storm was generally very good and deserving of praise, although there were some major problems.
- Intelligence *distribution* within the theater was very poor from the standpoint of many Air Force units.
- Intelligence *analysis* was mixed. On the most prominent analytical challenge of Operation Desert Storm the count of dead Iraqi tanks, APCs and artillery pieces the intelligence community had no generally accepted doctrine or methodology. The resulting problems of assessing battlefield damage revealed the true intelligence failure of Operation Desert Storm.

This report looks separately at intelligence collection, distribution and analysis, focusing on the core successes and failures in each of those categories. This report is the intelligence supplement to *Defense for a New Era: Lessons of the Persian Gulf War,* released in April 1992 by the House Armed Services Committee.

FINDINGS [1]

COLLECTION

- In general, the national intelligence community mobilized in support of Operation Desert Storm. Still, some national intelligence agencies appeared unfamiliar with or unresponsive to the intelligence needs of the warfighting commanders.
- Some senior CENTCOM commanders were unfamiliar with the capabilities and limitations of U.S. intelligence systems. There is a need for more extensive training.
- At the time of the invasion, CENTCOM intelligence was a shell, with few trained personnel, no collection assets under its direct control and no joint intelligence architecture of substance to guide the buildup of in-theater intelligence capabilities. Prior to the war, joint intelligence doctrine, architecture and training was lacking. While it is impractical to fully staff every combat command in peacetime, it is not unreasonable to demand that the chief function of the shell should be to know how it will expand to meet the demands of a crisis or conflict.

[1] Acronyms are expanded in the text of the report.

• ARCENT intelligence officers devised an imaginative system, called key reads from the football quarterback analogy, for matching intelligence collection resources to battle plans and against time constraints.
• While there were substantial shortcomings in tactical intelligence collection, particularly in the area of imagery, three new collection platforms JSTARS, ASARS and the UAV proved outstanding.
• The extensive campaign to trackdown Iraqi Scuds missiles was unsuccessful from a military standpoint it didn't get the Scuds before they were launched. The Scud campaign did, however, achieve important political goals.

DISTRIBUTION

• The inability to reliably disseminate intelligence, particularly imagery, within the theater was one of the major intelligence failures[2] in Operations Desert Shield/Desert Storm. One aspect of the problem was the lack of interoperable hardware: out of 12 secondary imagery dissemination systems (SIDS) deployed in-theater, only four could communicate with one another.
• The component headquarters staff often failed to pass available intelligence downward to the air wings and ground units. CENTAFs was the worst offender in this regard.

ANALYSIS

• The intelligence agencies had an excellent handle on the units, locations and equipment of Iraqi troops (but not the numbers of troops) deployed to face coalition forces the Iraqi Order of Battle despite Iraq's outstanding communications security and despite the U.S.-imposed ban on overflying Kuwait before the air war began.[3]

---

[2]The term intelligence failure is a piece of journalese that has fallen into everyday use, but is normally used much too loosely. Most commonly, it is adopted as a synonym for unknown or unpredicted. If the intelligence community did not forecast a coup in one country or a policy reversal in another, it is said to be an intelligence failure. The subcommittee does not accept this broad definition of failure. First, as in baseball, no one can be expected to bat 1.000—in fact, baseball stars with averages below .300 make it into the Hall of Fame. Intelligence, like baseball, is a matter of percentages. To set an unreasonably high standard does not avert failure; it commands failure. Intelligence officers of foreign governments have been known to lose their positions when they failed to inform their bosses that a favored U.S. senator would lose re-election or that a new secretary of state would be named who would alter a key policy toward their government. This demands too much of intelligence. Policymakers and private citizens who expect intelligence to foresee all sudden shifts are attributing to qualities not yet shared by the deity with mere mortals. In Iraq, before Operation Desert Storm, U.S. intelligence successfully located only half the major nuclear sites of which we are now knowledgeable. This was an intelligence gap. But it was not a failure because intelligence professionals warned that we lacked sufficient knowledge about Iraqs nuclear program. It would have been a failure if they had said they knew with high confidence every nuclear site. And we can say it was a failure that the intelligence community did not devote more resources to trying to fill in those gaps in its knowledge.

[3]A full disquisition on the count of Iraqi personnel § including the number killed and the number facing Coalition forces when the ground war was launched—appears on pages 29–33 of Defense for a New Era: Lessons of the Persian Gulf War, published April 1992 by the House Committee on Armed Services. There is a statistical error in that section. The number of Iraqi troops captured during Operation Desert Storm was 85,251. The figure of 63,000 shown in the text is the number of Iraqi troops captured by the United States, but excludes those captured by allied forces. This correction means that the estimated number of Iraqi troops who were either killed during the 100-hour ground war escaped the theater at the end of the fighting falls below 100,000.

- From among millions of structures within Iraq, the intelligence agencies pinpointed hundreds of military significance with few, if any, errors.
- The most serious failure of U.S. intelligence was in producing accurate battlefield damage assessment (BDA). The body count given General Schwarzkopf on Iraqi tanks destroyed during the air campaign was, in all likelihood, exaggerated. A careful analysis of units involving 22 percent of the claimed kills shows an overestimation of tanks killed by 100 percent and, perhaps, as much as 134 percent.
- More attention needs to be given to displaying intelligence data in digestible form telling commanders, for example, that a bridge is unusable by military vehicles rather than communicating an engineer's calculation that the bridge is 52 percent destroyed.
- The intelligence community had a good handle on Iraq's chemical capabilities, but a poor knowledge of its nuclear capabilities.

MISCELLANEOUS

- The efforts of the psychological war planners in the leafleting campaign were a major contributor to the collapse of Iraqi morale that made an overwhelming victory also swift and relatively bloodless for the Coalition forces.
- Gulf war intelligence shortcomings suggest the need for improving the ability of the assistant secretary of defense for command, control, communications and intelligence to integrate DoD intelligence resources into a coherent defense intelligence community, with interoperable capabilities tailored to meet the needs of both warfighting commanders and national intelligence consumers.

COLLECTION OF INTELLIGENCE

A diverse array of sophisticated intelligence collection systems was called upon to provide intelligence in Operation Desert Storm. Such collection means included national assets (i.e., those dedicated to supporting high-level policy makers as well as military commanders) and tactical systems (i.e., those systems organic to the military services that provide support directly to tactical commanders).

NATIONAL SYSTEMS

In general, the national intelligence community, which is responsible both for developing and operating national collection systems and analyzing or exploiting the information they have gathered, responded helpfully to the challenges posed by the Iraqi invasion and occupation of Kuwait. Clearly, a great deal of progress has been made since the Vietnam war in the ability of the national intelligence community to shift its focus from peacetime assessments for senior U.S. government policy makers to timely and effective intelligence support in wartime to the combat commanders-in-chief

(CINCs). Yet, despite the measurable progress, there were still performance gaps.

Normally, a CINC could expect to have both national and tactical assets in hand. But early in Operation Desert Shield, the build-up of in-theater intelligence capabilities was intentionally and rationally restricted by the commander-in-chief of the Central Command, General H. Norman Schwarzkopf. He was concerned that the Iraqis might drive southward into Saudi Arabia and perhaps as far as the United Arab Emirates before sufficient U.S. forces were in place to deter or defeat such an attack. Therefore, early on, the priority of the Central Command (CENTCOM)[4] was on the rapid build-up of combat forces rather than intelligence resources. Only when it became clear that enough force was in place to perform the defensive mission did the basic in-theater intelligence structure haltingly begin to take shape.

A key problem was that intelligence (and other support functions) had to compete with fighting forces for transportation to Saudi Arabia. Yet the fighting forces, to be effective, must have intelligence support. This argues for a plan in which early deploying forces would be integrated with self-deploying, i.e, airborne, intelligence collectors such as Rivet Joint (an RC-135 aircraft that supports tactical signals intelligence operations), U–2/TR–1 reconnaissance aircraft and the new Joint Surveillance and Target Attack Radar System (JSTARS) aircraft.

In Operation Desert Shield, the absence of early deploying tactical intelligence collectors meant that theater commanders were initially forced to rely heavily on national intelligence systems, such as satellites, as the primary intelligence collectors. In response to the invasion, much of the national intelligence community mobilized to provide CENTCOM commanders with an unprecedented view of Iraqi forces. Once Watch Condition (Watchcon) One was reached on August 1, indicating a strong likelihood of a major conflict, virtually every national intelligence collection system, including satellite and airborne platforms for gathering imagery (photographs of activities on the ground) and electronic emissions (e.g., radio traffic and radar signals) that could collect against targets in Iraq and Kuwait did so although (in some instances) this caused a concomitant loss of coverage of other important targets of collection.

Transmission of imagery demands significant communications capacity, so providing imagery isn't cost-free. In fact, U.S. communications were so stressed during Operations Desert Shield/Desert Storm that U.S. forces seriously considered leasing time on Soviet communications satellites. This option was never acted upon, however.

In late July, anticipating a major conflict, the Defense Intelligence Agency (DIA), on behalf of CENTCOM, took over from the Central Intelligence Agency (CIA) the responsibility for coordinating the tasking of national collection assets, with CENTCOM's col-

[4]The military's operational command for the Persian Gulf/Red Sea region is the Central Command (CENTCOM), based at McDill Air Force Base, Tampa. CENTCOM has component commands from each of the four services—the Army's ARCENT, Air Force's CENTAF, Navy's NAVCENT and the Marine Corps' MARCENT plus the Special Operations Command's SOCCENT. The intelligence staff within many military organizations is traditionally the second bureau, known as G–2 within the Army and the J–2 at the joint level, such as CENTCOM.

lection requirements taking priority over other potential users. (CENTCOM would itself take on that control over national assets several weeks later.) At the height of the war, close to one-third of DIA's several thousand employees were involved in assisting the war effort. For the first time, the Soviet Union took a back seat to another part of the world as an intelligence collection target.

Although national collection systems were poised to respond to Iraq's aggression by providing a large volume of data, CENTCOM/J–2 was unprepared for the magnitude of the task because the Defense Department had never assigned it the people and equipment needed to fight a war. This was a conscious decision. Logistics, intelligence and most support functions were intentionally not fully staffed during peacetime to handle major crises at the five combat commands around the world.[5] Thus, at the time of the Iraqi invasion, the CENTCOM/J–2 organization was a mere shell:

- CENTCOM/J–2 had no collection assets under its direct control. In fact, a senior CENTCOM/J–2 officer said the J–2 staff had never exercised with any particular collection systems.
- CENTCOM/J–2 did not possess the types or numbers of staff positions required to fulfill its wartime mission. The CENTCOM/J–2 first deployed to the theater on August 7 with a staff that numbered less than 10.

The intelligence capabilities were to be assembled at the time of crisis. The key to this process was missing, however. There was no meaningful intelligence architecture, or structure, to guide the build-up of in-theater intelligence resources. In other words, there was no adequate road map for constituting intelligence operations in the event of war.

Contributing to the low state of CENTCOM/J–2 readiness was the federated concept on which CENTCOM/J–2 was based. This meant CENTCOM had to rely upon the goodwill of the services and national intelligence agencies to loan or chop intelligence collection systems as well as personnel to it. Thus, CENTCOM/J–2 was an empty shell to which people and collection systems were to be attached in the event of conflict. According to a senior Washington-based military intelligence official, CINCCENT[6] never matured an intelligence capability as mature as other CINCs in other theaters had. Of course, CENTCOM differs from all other unified commands in that it is the only one without a permanent headquarters in its region.

It would be unreasonable to suggest that every CINC's staff should be fully manned for war in peacetime. The expense would be enormous and the staff members would have little to do. Full staffing would be a waste. However, it is not unreasonable to demand that the CINC's peacetime staff devote more time and effort to planning how it will expand in order to meet the demands of a crisis. The intelligence staff of CENTCOM and of all other CINCs must:

---

[5] European Command, Atlantic Command, Pacific Command, and Southern Command (covering Latin America), as well CENTCOM.

[6] Commander-in-Chief, Central Command, i.e, General H. Norman Schwarzkopf and his predecessors.

- Plan the expansion of the core peacetime staff into a full-fledged theater joint staff, identifying structures; hardware and primary personnel who will be mobilized to fulfill wartime functions;
- Identify the intelligence assets that will be needed for each anticipated contingency and how they will be mobilized and integrated; and
- Work with the services and intelligence agencies to assure that component intelligence functions exist and are readily integratable with the command in time of crisis.

Over time, the CENTCOM and component commands' intelligence organizations grew in size (at the height of the war, the number of staff reporting to the CENTCOM/J–2 totaled almost 700) and were better able to perform their missions, but progress was painfully slow. After the war ended, a CENTCOM intelligence staff officer said:

> In the final analysis, no theater-wide intelligence architecture was developed; J–2 mainly focused on meeting the day-to-day, minute-by-minute requests of the CINC. We understand the need for and are now working to develop a theater-wide intelligence architecture.

Clearly, priority needs to be placed on improving joint intelligence architecture, training and doctrine—for all the CINCs.

Two problems served to limit the degree of support to combat commanders from the national intelligence community. First, some national intelligence organizations appeared unfamiliar with or unresponsive to the intelligence needs of the wartime commander. The case of the CIA is instructive. Although individual CIA analysts were in regular contact with their counterparts in-theater and provided a substantial amount of useful intelligence data to Operation Desert Storm planners, the CIA as a whole adopted a hands-off attitude toward the concept of joining in the organized support given combat commanders. It refused to join the Joint Intelligence Center (JIC) located in the Pentagon, sending only liaison officers. When queried about this action, agency officials asserted that a) they lacked the staff to join the JIC and b) they needed to remain outside the JIC so they could provide independent assessments for senior policy makers. However, the CIA asserted that it a) answered 1,000 information queries from CENTCOM, and b) works on joint intelligence assessments every day with the other agencies represented in the JIC. The principal distinguishing characteristic found was that the JIC was run by the military while other joint assessments are normally chaired by the CIA. The CIA in the future ought to be part of the JIC.

Second, some combat commanders had little appreciation for the capabilities and limitations of U.S. intelligence systems; this lack of understanding limited the extent to which the vast amount of intelligence data being provided by national systems was exploited. Early on, senior CENTCOM commanders often refused offers of additional manpower and other intelligence resources. As one Washington-based senior military intelligence official put it, Schwarzkopf was a very strong CINC. He said nobody comes in

[the theater] without my permission. That made it hard to get [intelligence] specialists in. You had to do a kabuki dance.

CENTCOM refused for several months to approve the Pentagon's recommendation that a certain piece of intelligence hardware designed to facilitate the timely receipt and processing of satellite imagery be shipped into the theater. In order to impress upon senior CENTCOM officers the critical need to expand in-theater intelligence capabilities, senior military intelligence officials in Washington who constituted the Military Intelligence Board directed a tour of the theater in November 1990 and made recommendations to improve in-theater intelligence collection, distribution and analysis capabilities including a recommendation that CENTCOM accept the piece of hardware mentioned above. It also identified key personnel with specialized skills, such as experts in the tasking/management of various collection systems that were available to beef up CENTCOM's Intelligence staff. Finally, CENTCOM acceded and the device mentioned above was deployed to the theater in early December just in time to assist in the preparations for the air campaign. The result, unfortunately, was a delay in improving the quality and quantity of intelligence available to theater commanders.

Possible cures for the lack of understanding or interest in satisfying the wartime commanders' intelligence needs include:

- Frequent peacetime exercises of the theater Joint Intelligence Center (JIC), including the active participation of analysts from the national intelligence agencies and the use of actual collection assets;
- Periodic briefings for senior theater commanders regarding the capabilities and limitations of national collection systems;
- Establishment of permanent CIA liaison positions on the J–2 intelligence staffs of the various theater CINCs;
- Development by each wartime commander of detailed plans for an integrated wartime theater intelligence capability, to include evaluation of the plans in joint exercises; and
- Creation of a single, national, deployable JIC that would augment the staff of the relevant CINC in time of crisis.

TACTICAL SYSTEMS

It has long been recognized that a mix of collection assets to support our military commanders is vital. While national collection systems overall performed well during Operation Desert Storm, tactical collection systems, particularly tactical imagery and signals intelligence (sigint) collection systems, were unable to provide the same degree of support to field commanders. It is clear from Operation Desert Storm that the investment in tactical collection assets has not kept pace with the modernization of the military force structure. For example, some tactical sigint collection systems that move with the troops take a lot of time to set up in the field. With the speed at which Operation Desert Storm unfolded, these systems were often not set up and running until the battle had pushed

the Iraqis beyond collection range.[7] On-going programs in the Department of Defense will redress most of these deficiencies; Congress has directed that several of these programs be accelerated.

There were, however, three stars in the tactical intelligence show: JSTARS, ASARS and the Pioneer UAV.

JSTARS

The Air Force-Army Joint Surveillance and Target Attack Radar System (JSTARS) proved its worth beyond the shadow of a doubt during Operation Desert Storm, despite the fact that the system was still in development and was therefore deployed with entire components left out. The airborne JSTARS provided combat commanders with near real-time information on various targets, including moving targets, in all weather conditions. As one CENTCOM intelligence officer stated, JSTARS turned out to be our most valuable platform.

CENTAF didn't want JSTARS in theater at first. A senior Air Force officer said he understood the system was new and fragile and feared it would break down, siphoning off key support personnel as the command tried to maintain JSTARS. But the VII Corps, which had worked with JSTARS experimentally in Europe pushed hard for it. CENTAF relented, responding to VII Corps' urging after deciding that the builder, Grumman, was going to make sure the system worked even if it meant the CEO himself had to come over with a screwdriver.

JSTARS and other moving target indicator (MTI) platforms, such as the Army's OV–1D Mohawk, tracked the movement of Iraqi logistics/supply units throughout the war and tracked other mobile tactical targets. This information was passed, sometimes in near real-time, to strike aircraft for targeting and destroying these Iraqi forces. That was the benefit for the Air Force. For the Army, JSTARS showed that the Iraqi forces arrayed on the front lines were not dug in and about to attack. The Army liked the downlink which showed in real time what was in front of it, while the Air Force used it for target acquisition, chiefly of moving targets.

ASARS

The Air Force also used the U–2 reconnaissance aircraft with its Advanced Synthetic Aperture Radar System (ASARS) in conjunction with JSTARS. JSTARS used its MTI to track the movement of vehicles and then, acting as a battle management platform, cued the U–2 with its higher resolution ASARS sensor.

The U–2 ASARS provided continuous coverage all-weather, day and night for targeting during the ground war. In the future, the U–2 with ASARS is expected to act as an off-board sensor for JSTARS, providing higher resolution mapping and imagery of fixed targets, while concurrently collecting signals intelligence and its own moving target indicators from a higher altitude and different

[7] U.S. military forces have for decades been structured on the assumption that the European battlefield was the most challenging that would be faced; what would work in Europe would work elsewhere. These sigint systems were designed with the fairly static front anticipated for any European conflict. In Desert Storm, the front was anything but static, however.

orbit, thus giving another perspective of the battlefield by looking into areas masked by terrain from the view of JSTARS.

UAV'S

The Pioneer unmanned aerial vehicle (UAV) provided substantial imagery support to Marine, Army and Navy units during Operation Desert Storm. They were so good many more could have been used.

These systems were employed for battlefield damage assessment (BDA), targeting (e.g., adjusting the accuracy of the battleships' 16-inch guns, which were used extensively against Iraqi fortifications along the Kuwaiti coastline) and surveillance missions, particularly in high-threat airspace.

The intelligence officer for a Marine Division which was blessed with more UAVs than any other unit in-theater commented, UAVs were great for target validation and BDA, but we could have used three times as many as we had. The Army took its solitary set of UAVs into the war and is now looking for many more. In one instance, Iraqi troops actually attempted to surrender to a UAV loitering over their position.

OTHER SYSTEMS

As noted by one CENTCOM intelligence officer, Tactical intelligence collection systems were not permitted to overfly Kuwait or Iraq before D–Day. And that was a real limit. That decision was made to avoid losing aircraft and possibly setting off a fighting war before CENTCOM was prepare to fight it. Beginning on D–Day the first day of the air war, several platforms were employed to collect tactical imagery of key Iraqi targets. U–2 imagery was used extensively for Battlefield Damage Assessments (BDA) and discerning the disposition of key Iraqi units, including the three heavy Republican Guard divisions. Air Force RF–4Cs provided targeting and tactical BDA imagery. In addition, the Navy F–14 Tactical Airborne Reconnaissance Pod System (TARPS) proved useful in a variety of support missions for the Navy. Each of these systems has shortcomings, however.

Some systems like the RF–4Cs were available only in limited numbers because they were being phased out of the inventory. Other systems like the SR–71 had already been dropped from the inventory. Some intelligence officers complained that the services had retired intelligence platforms purely for budgetary reasons without providing sufficient means to fill in the holes in coverage that would otherwise open up. Without addressing those particulars, we believe decisions to retire intelligence assets, or otherwise curtail intelligence capabilities, should only be made after the impact on intelligence has been fully considered. Such decisions should not be made on a system-by-system or even service-by-service basis. Within the Defense Department, decision-making authority should lie with an official whose purview embraces the entire department, including intelligence purveyors and consumers, such as the assistant secretary for command, control, communications and intelligence. The director of central intelligence ought normally to be consulted as well when national systems are involved.

A clear lesson learned from Operation Desert Storm is the requirement for synoptic (wide-area) imagery of three types: (1) information for making maps and for providing terrain data to our most modern weapon systems such as the F–117, Tomahawk land attack missile and the F–15E strike fighter; (2) photographic coverage to allow analysts to locate and count an opponent's weapons systems and to assist in BDA; and (3) tactical targeting information that will allow the battlefield commander to locate and target key enemy forces, such as mobile missile launchers, troop units and supply convoys. As a senior CENTCOM intelligence officer stated:

> There is a need for wide-area synoptic coverage. The area occupied by Iraqi forces was on the order of 27,000 to 30,000 square miles, the size of four New England states. . . . In hindsight, getting rid of both the SR–71 (high-altitude photographic reconnaissance aircraft) and [a wide-area satellite imagery system] at the same time was shortsighted. The CINC lacked synoptic coverage.

The absence of wide-area coverage has been compared to "searching New York City by looking through a soda straw."

Many operational units complained loudly about the lack of timely and accurate tactical intelligence. Some such units created their own tactical intelligence sources to support operational planning needs. Some resorted to enhanced use of their own in-house capabilities, such as the 101st Airborne Division which, prior to the start of the ground war, used its AH–64 Apache attack helicopters as reconnaissance aircraft to map out the battlefield in front of the division. After the air war began, one Apache pilot said:

> We flew these missions deeper and deeper into Iraq, sometimes as far as 120 kilometers from the border. The purpose was to locate and catalogue Iraqi outposts along the anticipated route of advance and for future use in targeting. This seemed to be our division commander's best if not only accurate and timely source of "what-is-out-in-front-of-me" intelligence.

"Key Reads"

CENTCOM intelligence officers did show real ingenuity. For example, in an imaginative initiative, Operation Desert Storm planners recognized that the ground war likely would unfold at a very fast pace, much like a football play. Like a quarterback, headquarters wouldn't have a lot of time to absorb data on the rapidly unfolding battlefield situation.

So ARCENT G2 devised a system of 27 intelligence targets essential at a particular time to provide the information the combat commander would need to make a decision on the next step in the campaign. Collection resources were then assigned in advance to fit the combat plan. This was done by planning backward from the battle plan. For example, the battle plan called for the 101st Airborne Division to launch the second phase of its assault at an assigned hour. To pull that off, General Schwarzkopf would have to make the go or no-go decision two hours before the scheduled kick-off time. To make that decision, the principal information he would

need on the Iraqis was the disposition or movement of four Iraqi divisions in front of the 101st and any activity around three geographic objectives. These were the that needed to be made. Intelligence then went through its portfolio of collection resources and assigned two airborne platforms to check those targets in the hours before the go or no-go decision. National assets were also tasked to those targets, and signals intelligence was told to make those targets a priority in the hours beforehand.

While this rendition makes it sound like a simple process, it was actually much more complicated. For example, if one air asset was used for a Key Read in the morning, it couldn't be used in the afternoon because of the need for crew rest and maintenance. Some assets were only useful in daylight hours. All this required a great deal of juggling until a workable matrix was produced that balanced a) the battle plan with b) the CINC's decision points with c) the required with d) the available collection assets. The "key reads" intelligence collection/decision matrix was fundamental in determining when to launch the main ground attack and when it was safe for the VII Corps to wheel to its right and meet the Iraqi Republican Guard divisions. While the speed with which the war evolved overtook much of the planning that went into the concept, it was nonetheless an imaginative and professional initiative for linking intelligence collection resources to a commander's war plans, and at the same time realistically coping with the demands and strictures of time and limited collection resources. The concept was one of the high points of the contributions of intelligence to Operation Desert Storm.

THE GREAT SCUD CHASE

Locating and destroying mobile Scud missile launchers on the ground in Iraq proved to be a vexing problem. This was the first time the U.S. Armed Forces chased after mobile ballistic missile targets, and the results were very poor despite the fact that operations were conducted in more open terrain than found in most parts of the world. Continuous Combat Air Patrols (CAPs) involving various sensor platforms (including JSTARS) and F–15Es were considered the best hope for locating and destroying the Scuds. The huge effort contributed greatly to the political goal of discouraging Israel from entering the war. But the Great Scud Chase proved to be a double loser in military terms.

First, it diverted resources. One notable example of the diversion came while JSTARS was reporting the continuing ground battle at Khafji, the first of the war; despite the ongoing land battle, the plane was suddenly diverted to the West to look for Scuds.

It should be noted that the argument that the senior political leadership in Washington never micromanaged CENTCOM's operations is not entirely true. It was firm guidance from the Washington political leadership that the Scud hunt should take priority over other missions that led to the JSTARS aircraft being redirected from watching the on-going battle at Khafji to patrolling western Iraq in search of mobile Scud missile launchers. In addition, national systems were diverted from focusing on the battlefield to covering the politically sensitive oil spill at one point.

Second, there is no hard evidence that the Great Scud Chase destroyed even a single Scud missile or mobile launcher. (Several fixed Scud launch sites were destroyed, however.) During the war CENTCOM aired a film billed as showing the destruction of mobile Scud missile launchers, but Washington analysts determined within days that it actually showed fuel trucks and not Scud trucks.

In fairness, while the Great Scud Chase failed to kill Scuds and diverted valuable resources from other targets, it likely accomplished one military result by retarding the Iraqi Scud effort. To avoid detection, Scud teams adopted a shoot 'n' scoot policy. This meant they dropped the normal multi-hour set-up routines, including the lofting of weather balloons to obtain wind speed and direction data. As a result, the Scuds fired were most likely less accurate than otherwise. Also, the weekly volume of Scuds fired trailed off, suggesting that the overhead threat might have discouraged the Iraqi Scud teams from firing as often as they could.

The Scud problem was certainly not exclusively an intelligence problem. Even if intelligence could pinpoint the site from which a Scud had just been launched, the Iraqi crews could scoot away within minutes. In some instances, U.S. aircraft crews actually witnessed Scud launchings, but were still unable to locate and destroy the launcher on the next pass. Pre-war exercises showed that even when pilots knew the precise locations of parked Scud launchers it was difficult for their electronic sensors to pinpoint the launcher on the ground.

Unlikely Sources

There is a popular notion that intelligence comes exclusively from listening in on communications, purloining documents and the like. But often intelligence information comes from unlikely sources right under one's nose.

For example, in the preparation for the left hook, the intelligence agencies were tasked for all the information they could get on trafficability through the wastelands of southern Iraq. CENTCOM needed to know where the sands would be too soft to support tanks and where defiles would stop vehicles and require bridging equipment.

A great hunt was launched for data. One very helpful source turned out to be the Library of Congress. A crew of intelligence officers spent three days there pouring over old archaeological manuscripts and found trafficability data. Archaeologists early in this century had recorded minutiae on the countryside in their diaries as they slowly made their way across the sands on camelback.

Intelligence Support From Other Nations

The United States received incalculable assistance from friends and allies who would prefer to remain anonymous. Suffice it to say that while the United States haggled with other countries over their contributions of men and money, the U.S. government rarely had to haggle over intelligence assistance.

There were complaints from U.S. intelligence officers about the Saudi military intelligence system. It was the epitome of the stereotypical intelligence service; it didn't want to share anything.

Frustrated U.S. intelligence officials later found, however, that this was not an anti-American bias; Saudi intelligence was loathe to share its data with the Saudi military, too.

DISSEMINATION OF INTELLIGENCE

One of the clearest examples of an intelligence failure during Operations Desert Shield/Desert Storm was the inability to provide intelligence quickly and reliably to warfighters throughout the theater of operations. This failure was the result of two factors:

- First, only a third of the dozen secondary imagery dissemination systems (SIDS) deployed in-theater could transmit to one another, especially down at the operating unit level. These systems can be thought of simply as ruggedized, high-resolution high-volume photo-transmission or fax machines that encode material being sent—here, pictures taken by satellites or aircraft—so as to prevent its unauthorized disclosure; and
- Second, key intelligence staff, failed to pass much useful information down to the air wings and ground units.

MOST SIDS COULDN'T TALK TO OTHER SIDS

Just as there was no adequate intelligence collection architecture on August 2 to guide the build-up of in-theater collection systems, neither was there an architecture or structure to ensure that combat commanders received intelligence in a timely, efficient manner. The greatest problems were associated with disseminating imagery, essentially photographs taken by reconnaissance platforms such as satellites and aircraft.

As one intelligence officer put it, Imagery was the intel of choice of the combat commanders at all levels. During Operation Desert Shield, not less than 12 different secondary imagery dissemination systems were delivered in-theater. Each of the service component commands had brought with it one or more of its own SID systems. Individual pieces of hardware treated in isolation often appeared to function properly. For example, CENTCOM intelligence officers were bullish about the capabilities of the Digital Video Imagery Transmission System (DVITS), which was purchased by DIA for CENTCOM during the war. Only a few DVITS units were actually shipped into the theater before the war ended, however. On the other hand, the Air Force's Tactical Digital Facsimile (TDF) machines were slow in transmitting, had relatively poor resolution and did not possess an automatic error correction capability, which meant that when problems in the communications line were encountered, the entire fax had to be re-transmitted. The TDF was subject to much criticism before the war because of its expense about $688,000 each. Senior Air Force officers were almost unanimous in praising the TDF after Operation Desert Storm. Junior officers, who were at the receiving end, were almost unanimous in panning the TDF as an imagery transmitter. It was used chiefly to transmit typewritten material, which could have been accomplished with a much cheaper system.

The bottom line is that only 4 of 12 SID systems deployed in-theater were interoperable, i.e., only four could send pictures to one another. According to one CENTCOM intelligence officer:

> Intel data could be passed in real-time or near real-time (from Washington) to J–2 in-theater, but because of a lack of common imagery data dissemination systems, the component commands as well as forward-deployed units could not always gain timely access to such imagery. The Navy had their own systems, which could not interface with the Army's systems, which could not interface with the Marines', which could not always receive data from J–2. . . .

This was a failure of considerable magnitude. SID systems first entered the military in the early 1980s, a decade before Operation Desert Storm. Intelligence officers knew immediately that they would face an interoperability problem if they ever had to operate with another service. Professionals periodically discussed this potential problem throughout the 1980s, but little was done about it. First, no service was willing to give up its hardware and adopt hardware from another service. Second, there was no one powerful enough above the service structure to crack the whip and require the services to solve the interoperability problem. It wasn't until the end of the decade that the Defense Department strengthened the assistant secretary of defense for command, control, communications and intelligence (ASD C3I), giving the position the clout needed to enforce interoperability. But by then, a dozen SID systems were in the field. Nothing could be done in time for Operation Desert Storm. It will still be years before fully interoperable SID systems can be deployed in quantity.

In Operation Desert Storm, this meant much imagery had to be delivered by courier. In turn, this resulted in delays in the dissemination of images that were critical in determining the level of damage to particular targets during the air campaign and to planning follow-up attacks. The first three days of the air campaign benefited from months of careful planning and preparation, including full sets of target intelligence detailed packages of photos and maps showing targets plus anti-aircraft guns and missiles around the countryside. After three days, however, target imagery and current intelligence on mission performance decreased dramatically, and what did arrive was often late, unsatisfactory or unusable.

One wing intelligence officer said:

> There were actual times when we sent guys out with no imagery at all. They only got a map and coordinates to find a target at night. We did continue to get targeting materials, but the coverage was spotty and almost always dated. We put in our requests, but they got swallowed by a black hole. Of the over 1,000 missions flown by [one of the squadrons], we only got back four imagery responses, and all four were of such poor quality that we couldn't even read the date to check [their] currency.

The lack of interoperable secondary imagery dissemination systems was one cause of the restricted flow of intelligence to front-line ground units, which complained repeatedly about the lack of

timely and accurate tactical intelligence on battlefield conditions. For instance, one brigade of the 82nd Airborne Division stated that it did not have a clear idea of what Iraqi forces were over the next hill because intelligence was so poor. In fact, the brigade felt it operated in the dark for the first two to three days of the ground offensive until it received fresh information from the French. The Marines were just as dissatisfied as the Army. Lieutenant General Walter Boomer, the senior Marine commander in theater said, I remember being in Vietnam for two tours and never getting a single piece of useful intelligence. It has gotten better, but we still can't get to the company level what they need to do the job.

This failure is largely the result of individual service initiatives with little or no oversight by responsible officials within the Office of the Secretary of Defense (OSD). Passage of the Goldwater-Nichols Department of Defense Reorganization Act in 1986 was intended to signal to the Services that the old days of fighting separate Army wars, Air Force wars and Navy wars were over and that they would have to plan and operate jointly. The message got through to the warfighters, as Operation Desert Storm proved, but the deployment of non-interoperable secondary imagery dissemination equipment demonstrates that the Goldwater-Nichols message bears repeating.

As previously noted, Defense Secretary Cheney recognized the problem and strengthened the position of assistant secretary of defense for command, control, communications and intelligence. The committee's review of the Gulf war provides ample evidence of the need for a strong ASD(C3I). In addition to enforcing interoperability, the Operation Desert Storm experience suggests the ASD(C3I) should be responsible for:

- The overall integration of DoD intelligence resources into a coherent defense intelligence community;
- Assessing and policing the overall responsiveness of the DoD intelligence community to its operational clients;
- Reviewing CINC operations and deployment plans for the adequacy of the planned theater intelligence architecture and deployment timing;
- Ensuring that the intelligence capabilities needed to support CINC plans do exist; and
- Advising the defense secretary on decisions involving the retirement of intelligence assets and the fielding of follow-on capabilities.

The fact that virtually everyone interviewed agreed that secondary imagery dissemination was a major problem has helped in developing and implementing a solution. The solution, in this instance, need not be single piece of hardware. More importantly, the Office of the Secretary of Defense needs to proceed with promulgation of a single set of imagery transmission/dissemination standards and protocols to guide the development of future SID systems and the necessary modification of existing systems to ensure interoperability.

A final note: Imagery was the intel of choice in this war. That does not mean the next war will be an imagery war. Operation Desert Storm was fought over fairly open terrain with little cloud

cover. That was not true of World War I, World War II (except for the North African campaign), Korea or Vietnam. And it will not necessarily be true of the next war. While imagery fixes are clearly essential, the prominence of imagery in Operation Desert Storm should not lead us to neglect signals intelligence and other sources of useful intelligence information.

Some Officers Wouldn't Talk to Other Officers

The timely dissemination of intelligence throughout the theater of operations was hindered also by bottlenecks within the component commands. In seeking to explain how or why these bottlenecks emerged, it is important to keep in mind that never before in the history of the U.S. military had this volume of intelligence (particularly imagery) been sent into a theater of operations. As discussed above, intelligence collection systems that in the last war had been considered purely national (i.e., those developed and deployed by national intelligence agencies and dedicated to supporting Washington policy makers and senior military commanders) were now providing massive quantities of data to the tactical combat commanders. So to some degree simply the amount of intelligence flowing into the theater may have overwhelmed CENTCOM and the component commands' intelligence staffs.

But this explanation fails to take note of a worrisome trend that emerged during the course of the war namely, the hoarding of intelligence by the component command staffs who failed to pass a variety of useful intelligence reports and analyses downward to the ground units and air wings. There was a tendency to sit on information rather than disseminate it. Senior officers repeatedly denied that there was any hoarding whatsoever. In fact, this conclusion was clearly offensive to many senior officers who staffed the intelligence operation in Riyadh. They insisted that some junior officers simply had an insatiable appetite for intelligence they didn't need. This is a generally recognized historical phenomenon. Senior officers also argued that it was Riyadh's job to prioritize data for dissemination, and that all units did not have an equal need to know.

Finally, they argued that capacity limitations on communications transmissions meant Riyadh could not distribute all that it might otherwise have distributed. It is true that unreasonable demands were levied on CENTAF. Moreover, the demand for imagery in this war far exceeded what anyone had anticipated, thus placing an immense load on the intelligence officers in Riyadh. Finally, there is certainly no evidence of any plot or conspiracy to deprive operating units of needed data.

That said, unreasonable demands from junior officers with insatiable appetites for imagery by no means explains away all these complaints. The sheer volume of complaints received from junior officers from the air wings was disturbing. Similarly, numerous Air Force wing intelligence officers reported the amount of intelligence they received actually declined once the CENTAF intelligence operation in Riyadh was operating an observation that conflicts with the assertion that transmission capacity limited what could be sent.

In Operation Desert Storm, the ground units and air wings clearly did not receive the volume of intelligence support they had come to expect and that could have been provided. In one instance, 50 imagery overlays were shipped from Washington to Riyadh to be distributed among the air wings, but the warrant officer responsible for their distribution only got five copies; the rest simply disappeared within the headquarters staffs where the displays were found attractive. Repeatedly, CENTAF target planners complained that CENTAF intelligence officers had to be forced into even talking to them and sharing information.

One squadron told of receiving a visit from a Riyadh-based general, not assigned to intelligence, who wanted to see if the unit was ready to fight. When the squadron intelligence officer spread out the limited materials he had received, the general said that his office was packed with data that would improve the squadron's work. The next day the general dispatched a C–21 loaded with imagery of the target areas the squadron had been assigned. In another instance, an officer from a unit that was flying daily patrols over Scud areas bumped into a friend who flew RF–4 photo reconnaissance planes. The reconnaissance pilot said he was flying photo flights that covered Scud areas virtually every day. But the unit flying the Scud CAPs (Combat Air Patrols) had never received RF–4 imagery taken by that or any other unit. Officers from the 480th Tactical Intelligence Group at Langley Air Force Base, Virginia, whose wartime tasking is to feed target data down the chain to fighting units, described intelligence materials they prepared for the air units in theater materials air unit intelligence officers said they never received.

While there was no scheme to withhold necessary data, the Riyadh intelligence staffs shared a mind-set that they were better placed than the operators to determine what the operators needed. Adding to the mind-set problem was the limitation mentioned earlier: CENTAF/Intel, like CENTCOM/J–2, was essentially a facade before the war. It didn't adequately exercise with the operating units or support their intelligence needs in peacetime. As one officer in a flying unit commented:

> When we go into combat, everyone is doing it for the first time. This is why so many units like ours got used to going to TAC [Tactical Air Command] for intel over the years and developed a good relationship with the 480th [which is part of TAC and services tactical flying units in peacetime]. They knew what our needs were, were familiar with the weapon systems and had an appreciation for the support we would need.

CENTAF/Intel, in other words, was a largely unknown entity to the operators just as the flying units were largely unknown to CENTAF/Intel.

The communications problems that permeated CENTAF/Intel were found in other CENTAF elements as well. The cell responsible for planning the air campaign, known as the Black Hole for its secrecy, was unable to establish a satisfactory liaison with the intelligence staff during the crucial planning period prior to hostilities.

Even after very senior officers in CENTAF headquarters intervened, cooperation in the planning effort was marginal at best.

Although this intelligence hoarding was primarily an Air Force problem, there were some similar complaints from Army units, chiefly concentrated in the XVIII Airborne Corps. Senior Army intelligence officers said XVIII Airborne did indeed get less data than VII Corps units. The Army concentrated its resources on aiding those units expected to see the most combat. Thus, there was a conscious bias toward VII Corps over XVIII Airborne. And within the VII Corps, there was a bias toward units breaching Iraqi lines. XVIII Airborne Corps told of getting more help from the French forces attached to the XVIII. The French combat units had deployed with their own tactical intelligence collectors.

Because the operators believed that the CENTAF intelligence staff could not be relied upon to provide timely and accurate intelligence, some units, as mentioned above, cultivated backchannel intelligence conduits, many times across traditional theater and service boundaries. One officer from an Air Force wing said:

> My best sources of intelligence came from outside of CENTAF channels. I knew some people at the Army Intelligence Threat and Analysis Center (ITAC) in Washington and they became an invaluable resource in supporting the wing. I also tried to tap into the 544th at the Strategic Air Command in Omaha, but struck out. I was able to link up with the 480th at Langley AFB, but CENTAF would continually try to cut off this channel.

Examples of this sort of enterprise brought mixed reaction from organizations in the intelligence community. One school objected to the violation of procedures while another thought such an all-source approach was appropriate.

ANALYSIS OF INTELLIGENCE

Tactical Battle Damage Assessment

The core analysis problem of Operation Desert Storm centers on tactical battlefield damage assessment (BDA) the count of Iraqi tanks, armored personnel carriers (APCs) and artillery pieces knocked out by the air campaign before the ground offensive kicked off. This was the greatest challenge and the greatest failure of the intelligence community in Operation Desert Storm.

The Army (ARCENT G–2) rather than the air units was given the authority to rule on the damage done by the tactical air campaign. General Norman Schwarzkopf sensibly chose to have the Army—which would have to face any surviving tanks, APCs and artillery pieces—rule on how many pieces of equipment air power was knocking out.

It turned out, however, that the Army had little idea of how to do this. There simply was—and is—no book, no doctrine on how to conduct tactical BDA.

In Operation Desert Storm, the ARCENT G–2 wrote the formula decreeing what proportion of pilot claims and alleged gun camera kills would be recorded as real kills. This was extremely important because the kick-off of the ground war was keyed chiefly to this ob-

jective of diminishing enemy combat capability—one goal being to destroy 50 percent of Iraqi equipment (tanks, APCs and artillery pieces) in frontline units before launching the ground attack. To formulate these statistics, the ARCENT G–2 determined, for example, that he would count 75 percent of all the kills reported by A–10 crews. The A–10 does not have a gun camera. But A–10s normally operated in pairs and ARCENT decided the trailing pilot generally had a good enough view of what the lead pilot accomplished to accept three-fourths of all claims. Other percentages were adopted for other pieces of equipment.

In Washington multiple intelligence agencies expressed strong reservations about the rapidly mounting count of kills. The agencies believed senior commanders and Washington policy makers were being given inaccurate and optimistic counts. Washington analysts objected, for example, to accepting 75 percent of A–10 claimed kills. The analysts said this was unreasonable and without scientific basis. Pilots are historically much too optimistic about their accomplishments. Moreover, Operation Desert Storm pilots didn't have the leavening experience of months of war. Even if pilots were right that they'd hit X number of tanks that day, who's to say those same tanks hadn't been hit the day before. The resulting double, triple, and quadruple counting—all done innocently—could amount to an immense portion of the claimed kills, the Washington agencies argued.

This dispute came into public view when it was leaked and appeared in articles in *The New York Times* and *The Washington Post* early in February. General Schwarzkopf was vocal in objecting that people outside the theater had no business interfering with the work being done in-theater by people who had access to more hard data that is, the pilot reports and gun camera film than the people in Washington who saw only satellite and U–2 photography.

The leaks and loud argument over who had access to what data tended to obscure a very important factual development. After the Washington agencies expressed their strong reservations, ARCENT changed its standards and accepted fewer pilot claims and fewer alleged kills from gun camera film. For example, where at first ARCENT tallied 75 percent of the claimed A–10 kills, after the Washington agencies raised their objections ARCENT decided to accept only one-third of the A–10 claimed kills.

Clearly, despite General Schwarzkopf's complaint of interference from Washington, his Army component G–2 eventually agreed to a substantial degree with the reservations coming from Washington.

There is a widespread belief within the intelligence community that General Schwarzkopf's anger against the Washington intelligence community stemmed from his view of the Washington community's objective in airing its reservations. This school of thought holds that Schwarzkopf believed the Washington community did not speak up in order to be helpful, but to distance itself from General Schwarzkopf's anticipated decision to launch the ground attack. This interpretation sees Schwarzkopf irate that people in Washington were plotting to blame him if the attack went poorly by positioning themselves to claim that he acted on data they knew to be wrong. Hints to support that view are contained in the general's testimony on Capitol Hill. For example, he said there was

some distancing on the part of some agencies from the position of the Central Command. And later he said the national intelligence agencies were all distancing themselves from Schwarzkopf. . . ."[8]

These episodes offered a rare glimpse into the unsettled world of battlefield intelligence. But the key questions remained unanswered: Who was right about the numbers and what did it mean? As it happens, a unique post-war assessment is available to suggest some answers.

The day after the war ended, a solitary U–2 flew back and forth over large parts of the battlefield clicking off thousands of photographs of the destruction below. Alone among the parties, one Washington agency admittedly not an impartial observer in the intelligence disputes assigned its photographic interpreters to count the damage. The results are extremely important, for they show that even Washington's more conservative estimates of pre-ground war damage were high.

The Washington analysts focused their post-war review exclusively on counting tanks within the three Republican Guard heavy divisions. These three divisions possessed almost all of the Iraqi inventory of T–72 tanks, which photo analysts can easily identify.

CENTCOM reported that 388 of the approximately 846 tanks in the three divisions were destroyed from the air prior to the start of ground fighting. If true, that would have represented 22 per cent of all Iraqi tanks from all the divisions in the Kuwaiti theatre killed during the air war.

What made these divisions particularly good subjects for a post-war study was that they had remained hunkered down in their positions for most of the air war and moved out to fight or flee once the ground war began. This opened the way to the creation of an unusually clear-cut standard for the usually subjective nature of interpretation of aerial photography, or imagery in the current terminology.

The analysis first made the generous assumption that any tank found in the deployment areas of these three divisions at the end of the ground war had been disabled by the air campaign that preceded the coalition ground attack. The reasoning went this way: if the tank hadn't been disabled when the ground war started, it would have moved either to join the fight or flee. This is a generous assumption that actually favors defenders of the air campaign's success because some tanks untouched by the air campaign were abandoned either because their crews had deserted earlier or they were unusable due to poor maintenance and lack of spare parts.

When the post-war U–2 imagery was examined, it revealed that 215 of the tanks of the three divisions remained in their deployment areas. This meant that the CENTCOM count of tanks destroyed prior to the start of the ground war in the Tawakalna, Medina and Hammurabi Republican Guard divisions was exaggerated in the order 100 percent.

The analysis then went a step further. One of the divisions, it was known, had fought near and in its deployment area. So interpreters applied finer-grain but more subjective analysis to the

[8] General Schwarzkopf's congressional testimony relating to intelligence during Desert Storm is included in the appendix to this report.

tanks left in this area, looking at such things as which way the tank was facing and the pattern of tank tracks in the sand.

By this analysis, 166 of the tanks in the three divisions had been killed, versus the CENTCOM. Thus the CENTCOM margin of error would be upwards of 134 percent.

No comparable studies were done elsewhere, so, no reliable analysis exists to gauge the accuracy of BDA for the 40 other Iraqi divisions in the theater. However, it is reasonable to conclude that many of the same methodological problems that led to an inflated BDA count for the three Republican Guard divisions would have similarly skewed the accuracy of the air war BDA estimates used throughout the Kuwaiti theater of operations.

The sheer size of the numerical disparity revealed by the post-war analysis suggests a fundamental methodological failing in the manner BDA was conducted by CENTCOM that exceeds the normal margin of error expected of any such exercise. The absence of a book or doctrine on tactical BDA is the biggest and most significant intelligence failure of Operation Desert Storm. It is, therefore, essential that the intelligence community, at all levels, develop accepted, rational and precise doctrine for conducting tactical BDA in the future.

It should be noted that this post-war analysis generated some controversy within the intelligence community. However, an examination of the objections raised during the course of preparing this report tended to reinforce rather than weaken the judgment that there are fundamental problems in bomb damage assessment.

This analysis would not be complete without pointing out the obvious: Despite the faults found with the counting, the ground attack sliced through the Iraqi Army effortlessly. The numerical errors noted here indicate an intelligence failure, but they did not precipitate an offensive failure. CENTCOM's threshold of destruction for launching the ground attack was probably higher than needed. Even the Superbowl victor would likely go down to defeat at the hands of any other NFL team if a quarter of its players were removed just before a game. Similarly, an Iraqi unit that wasn't a real match for an American unit to begin with may well have crumbled into ineffectiveness long before General Schwarzkopf's attrition goal was even approached.

In fact, that's what the numbers would indicate. The Hammurabi Armored Division was only hit lightly during the air campaign. It fled the field without joining the ground battle. The Tawakalna Mechanized Division and the Medina Armored Division both left their revetments when they learned the weight of the coalition ground attack had swung around in the left hook offensive and was about to descend upon them from the west rather than the south. The surviving vehicles in the two divisions moved out to the north and west and formed new battlelines facing west. The postwar overhead photography showed that 93 Tawakalna and 99 Medina tanks were knocked out on those battlelines. Yet throughout the entire theater of operations, only 18 Abrams tanks suffered signifi-

cant combat damage including seven from friendly fire.[9] Theater wide, the U.S. Army only lost two tanks to enemy fire while these two Iraqi divisions alone lost 192 tanks to the Coalition's ground campaign.

It is important to note that the issue here is not the efficacy of air power. As the committee noted in its earlier report, *Defense for a New Era: Lessons of the Persian Gulf War*, published in April 1992, The decisive factor in the war with Iraq was the air campaign. It would be wrong to conclude that the analysis presented here belittles the air campaign. This analysis does, however, belittle the bomb damage assessment performed by CENTCOM.

The air campaign achieved its goal of breaking the Iraqi Army even though the BDA methodology exaggerated the actual toll of dead tanks. In the next war, however, such an intelligence miscount may not be so benign. CENTCOM thought a 50 percent attrition rate was required to break the Iraqi Army. It appears, in retrospect, that a much lower threshold was sufficient. If U.S. forces enter the next war considering that 25 percent attrition is adequate while the BDA figures exaggerate the damage by 100 percent, we could be in for some nasty surprises. Thus a more accurate counting methodology is a requirement. BDA is now neither art nor science.

The intelligence community will undoubtedly bicker for years over these post-factum calculations. The arguments will be useful if they help the community devise a doctrine for tactical BDA so that commanders in the future can be better served.

A further note: This counting problem was not unique to the high visibility topic of Iraqi Army hardware. It happened elsewhere. One general officer observed that the number of Iraqi naval vessels reported sunk eventually totaled three times the number of naval vessels Iraq possessed. And, while the intelligence agencies never knew for certain how many Scuds Iraq possessed, the total number of claimed Scud kills was four times greater than the upper end of the intelligence estimates for Iraq's total Scud inventory. A postwar review of photographs cannot produce even a single confirmed kill of a Scud missile.

Displaying Analysis in Digestible Form

A key part of intelligence analysis is displaying the material for commanders in a digestible form. Some intelligence analysts tend to get carried away and like to show off the volume of material they have collected. But volume is meaningless to commanders. They need to know: What does it all mean? General Schwarzkopf has publicly discussed a few aspects of this synthesis aspect of analysis that irked him.

One of his complaints was the propensity of technically trained analysts to produce technical analyses that were militarily obtuse. The classic example from Operation Desert Storm was the report given to General Schwarzkopf of a bridge that was 52 percent destroyed. He wanted to know what that meant. Could tanks cross

[9]The 18 M1A1 tank losses break down as follows: seven to friendly fire; two to enemy fire; four to anti-tank mines; two to onboard fires of unknown origin; and three that broke down and were destroyed by U.S. forces to prevent their capture.

the bridge? No. Could trucks cross the bridge? No. Then, from an operational military standpoint, the bridge was 100 percent unusable. The formalized analysis done from an engineer's standpoint was misleading and unhelpful to the military professionals.

General Schwarzkopf also complained about analyses from Washington that were heavily caveated. In testimony on Capitol Hill, the general testified:

> The analysis we received was unhelpful. And it was unhelpful because it ended up being so caveated. . . . There were so many disclaimers that by the time you got done reading many of the intelligence estimates you received, no matter what happened, they would have been right. And that's not helpful to the guy in the field.

There is, indeed, a well-known and frustrating tendency among intelligence analysts to compose their words so carefully they can claim perfect insight no matter what the outcome of events. But General Schwarzkopf did not just strike out against this tendency. He specifically attacked the numerous caveats that appear in intelligence estimates and predictive analyses. While the general complains that this is not helpful, the opposite would be even less helpful. One cannot remove caveats from predictive analysis without projecting a false certitude. Still, what an analyst can and ought to do is present his predictive analyses with notations on probability or confidence rates. Is it predicted that Saddam will react that way given this military circumstance because he always did so during the Iran-Iraq war and, therefore, there is high confidence in the predicted reaction? Or is the prediction based on surmises and vague parallels and therefore the prediction warrants only a low probability?

Tracking Saddam's NBC Capability

The U.S. intelligence agencies had been closely watching Iraq's nuclear, biological and chemical warfare capabilities for many years before Kuwait was invaded. This had nothing to do with political relations with Baghdad. A major target of U.S. intelligence has long been NBC capabilities, whether they be in friendly or hostile nations.

Although NBC has long been a major focus of all U.S. intelligence agencies, it is clear from the postwar revelations extracted by the United Nations that the U.S. intelligence agencies did not know the entire picture. Based on what is known now, the U.S. intelligence community:

- Had good intelligence on Iraqi chemical capabilities.
- Had poorer intelligence on Iraq's nuclear capabilities in fact, based on the data gleaned from defectors and other sources since the end of the war, it is now known that we were totally unaware of more than 50 percent of all the major nuclear weapons installations in Iraq.
- Had an indeterminate record on Iraq's biological capabilities given that the UN has extracted very little additional information on Iraqi biological capabilities, there is no new data base against which to judge the performance

of the U.S. intelligence agencies against Iraqi BW before the war.

There was clearly inadequate data on Iraq's nuclear operations. However, it is only fair to point out that before Operation Desert Storm, the U.S. intelligence agencies knew full well that they had inadequate information. Estimates from individual analysts of the time it would take Baghdad to build a nuclear device ranged from six months to 10 years, reflecting the sizable holes the analysts knew made Swiss cheese of their data base.

Unfortunately, during the war, U.S. military and civilian officials painted an overly optimistic picture of the extent of the damage caused by the Coalition's strategic bombing offensive. For example, on January 23, 1991, President Bush said, Our pinpoint attacks have put Saddam out of the nuclear bomb-building business for a long-time to come.

That this claim was overstated is clear.

- First, analysts knew they lacked the full picture of Saddam's nuclear bomb-building business.
- Second, the United States knew that while it had 5-1/2 months to prepare the bombing plan, Saddam had the same 5-1/2 months to evade its effects by moving equipment out of sites that had been identified for Saddam's benefit in hundreds of newspaper and magazine articles.
- Third, it is entirely likely that scientists and technicians were evacuated from facilities when the war started, leaving Saddam with the two elements more important than hardware: trained minds and a corporate memory that would allow renewed NBC efforts to compress the learning curve.

Still, since the intelligence agencies knew so little about Iraq's nuclear plans, it is easy to slap the label of intelligence failure on their performance. As noted earlier, that term lacks precision; and it would appear inappropriate to apply that term when intelligence officials acknowledged to the House Armed Services Committee long before Operation Desert Storm that they lacked enough information to feel confident they knew the status of Iraq's nuclear program.

What is clear is that inadequate resources were applied to gathering data on the Iraqi nuclear effort. Two elements might be isolated for note.

First, in July 1990, the Defense Intelligence Agency (DIA) had 42 persons in its Washington headquarters assigned exclusively to the POW/MIA issue and two assigned to Iraq. The former reflects the political sensitivity of the POW/MIA issue. And given recent developments, the numbers assigned to this topic are now rising rapidly. The relative insignificance of the numbers assigned to Iraq reflects the higher priority given to POW/MIA matters and, of course, the communist world.

Second, the use of human intelligence (humint) from potentially recruitable Iraqis has been downplayed generally by the United States. When it came to Iraq, there simply wasn't very much humint. This reinforces a long-standing criticism of the American intelligence community: that it is technology-smitten at the price of

shortchanging the human collection aspect. We would do well to recognize that in the Third World, human collectors are relatively easy to find. Humint has its limitations. It is but one facet of intelligence collection. But it is a facet that has been downgraded to our harm, as has been demonstrated by the relative paucity of data from the ground—as opposed to overhead—that was available about Iraqi nuclear capabilities.

This should not imply, however, that anything less than great care went into the selection of bombing targets. In that regard, it is useful to review the record on one target, the Baghdad baby milk factory, that proved to be one of the most controversial of the war.

That particular plant was first pinpointed as a potential biological site in 1983. It was watched for more than eight years as data on it grew in files in Washington.

A baby formula plant is very similar to a plant for making some types of biologicals. The main difference would be the need to provide much better security at a biological plant, for example, containment systems to protect against leaks from the driers, which would otherwise be the same in a baby milk plant as in a biological warfare plant. While the Baghdad plant had no secure containment system, that is not proof the plant was an innocent site. UN inspectors who have visited admitted chemical sites in Iraq have remarked on the absence of even fundamental safety measures there. Furthermore, the Baghdad milk plant did have another kind of security. It was viewed as odd that a milk plant would have a manned security gate and be surrounded by a nine-foot fence. The milk plant also adjoined a major military installation an installation long at the center of Iraqi unconventional warfare operations. Still, it was treated only as a *potential* biological site.

Over the years, data on the milk plant mounted. Some evidence pointed to the plant as a biological site. But other evidence, which remains classified because it involves sensitive sources and methods, was contradictory. Long into Operation Desert Shield it was still listed simply as a *potential* biological manufacturing plant.

Then, in December 1990, the Iraqi authorities began applying a mottled camouflage scheme to the roofs of two confirmed biological sites. At the same time, the same camouflage scheme was applied to the roof of the milk plant. The site was immediately shifted from the potential list to the confirmed list and made a target for the air campaign that was to begin in just two weeks.

Today, almost two years after the end of Operation Desert Storm, we still do not know with absolute certainty whether the plant that was bombed was a biological site or a legitimate baby milk plant. That would probably require a look at the paper documentation that exists only in Iraqi government files. But it can be said that the U.S. intelligence community devoted considerable effort to deciphering the nature of the plant and did not offer it for the target list *willy-nilly*. General Schwarzkopf disliked caveats. When intelligence proposed structures for the target list, there were no caveats, no nuances, no footnotes. A building was either on the list or off it. It would be naive to suggest that 100 percent of the structures put on the target list were appropriate military targets. Such accuracy is unachievable. And if it is demanded that no building be placed on the list without unimpeachable and unqualified evi-

dence, then target lists would be very short indeed and, in this case, even more of Saddam's military structure and weapons of mass destruction would have emerged from the war unscathed.

There are literally millions of buildings in Iraq. To pinpoint a few thousand central to Iraqi military operations was a daunting challenge. Yet even the Iraqi government contends that only a few structures like the baby milk plant and a shelter in Baghdad were wrongly targeted. The Iraqi government thus provides the best evidence available to date of the accuracy of the target list.

DETERMINING IRAQI MORALE

In the end, the total collapse of Iraqi morale was central to the huge victory won with minimal casualties, but the extent of the collapse was not understood by intelligence. How could it have been assessed?

Morale can't be seen in photographs, where the United States has placed so much of its resources. Morale can't be heard directly in signals intercepts. Hints were picked up in those intercepts, but they were hints and not conclusive. And the principal human intelligence came from defectors. They did report exceedingly poor morale.

Defectors, however, are historically a notoriously poor source of information on morale; they clearly have poor morale themselves or they wouldn't have defected and traditionally they project their attitudes on their fellow troops. But the number of defectors was so small (only about 800 during the air campaign out of hundreds of thousands) that the volume itself was evidence against theories of plummeting morale. The first solid evidence that Operation Desert Storm might be a rapid success came only days before the ground campaign was launched when reconnaissance teams crossing the border reported coming across empty bunkers. Only then did it sink in that massive numbers of Iraqi troops had fled homeward. From an analysis standpoint, therefore, U.S. intelligence did not get a full picture of Iraqi morale until late in the air war.

Psychological warfare is not an intelligence function, but from an operational standpoint, U.S. intelligence contributed to the psychological war campaign that was a key factor in the collapse of Iraqi morale.

Psychological warfare plans homed in from the very beginning on a major effort to attack the Iraqi willingness to fight. A key component of this was the leaflet campaign. Throughout the air campaign, a total of about 27 million leaflets were dropped in the Kuwait Theater of Operations (KTO). They fell into three categories:

SURRENDER DIRECTIONS

This category told Iraqi soldiers how they should surrender, such as positioning their rifles over their shoulders muzzle down and holding the surrender leaflets above their heads. These leaflets were widely described in the media, but were the least significant of those dropped.

B–52 WARNINGS

One day an aircraft would fly over an Iraqi division dropping leaflets that said, Tomorrow we will bomb the 21st Division. To save yourself, leave this area. The next day, the B–52s would come and drop thousands of tons of bombs on the division deployment area. The third day another plane would drop leaflets saying: We told you we would bomb here. We bombed when we said. We will be coming back. Leave this area. These leaflets showed Iraqi soldiers that their own forces could not protect them from a pre-announced attack.

VEHICLE WARNINGS

Where the B–52s were not operating, other aircraft were busily targeting tanks, APCs and artillery pieces. In these areas, aircraft dropped leaflets that told the troops the Coalition was targeting vehicles and warning the soldiers to stay away from the vehicles if they wanted to be safe. Interviews with Iraqi POWs later showed that the Iraqi soldiers saw that the American pilots were in fact attacking vehicles and not personnel bunkers. Iraqi officers had told their troops that the Americans would shoot them if they were captured. The Iraqi soldiers, however, putting together the warning leaflets and their observation that U.S. aircraft were not targeting personnel, reasoned that the Americans would not shoot them if they surrendered. As a result, when the ground campaign began, many Iraqi soldiers were eager to surrender and felt safe in doing so.

After the war, captured Iraqi officers were interviewed at length. They believed that the greatest damage to troop morale came from the B–52s. This same point was made by many captured Viet Cong and North Vietnamese soldiers a quarter-century ago. In both instances, troops were stunned psychologically by the B–52 bombing because, unlike other aircraft, the B–52s a) fly too high to be heard coming and b) carry an immense tonnage. As a result, a B–52 raid begins without warning when whole acres of the earth simply erupt in flame, noise and smoke.

But in Vietnam, the B–52s couldn't pull off the destruction of enemy morale. In Operation Desert Storm, the synergism of a) the bombing campaign, b) the psychological war leaflets and c) the lack of commitment of Iraqi soldiers to Saddam Hussein's cause were the triptych of elements that led to the total demolition of Iraqi morale. And the destruction of Iraqi morale was key to the swift victory with few casualties.

CONCLUSION

In conclusion, the performance of the U.S. intelligence services in Operation Desert Storm was mixed.

The three most serious shortcomings that came to light are:

- The absence of any book or doctrine on assessing battlefield damage.
- The Services' deployment over the years prior to Operation Desert Storm of Secondary Imagery Dissemination Systems that couldn't communicate with one another.

- The institutional failures, especially in CENTAF, that reduced the volume of intelligence disseminated to the operating units as the headquarters charged with that dissemination grew larger and more capable.

The three most successful accomplishments of intelligence in Operation Desert Storm were:

- The imaginative creation of the concept, in which intelligence resources were tailored in advance to produce the data the commander needed when he needed it, rather than just a flood of unassimilated facts.
- The apparently accurate breadth and depth of detail accumulated on the Iraqi chemical warfare program, the Iraqi Order of Battle, and a multitude of structures scattered throughout Iraq identified as having military significance, without which the air war would never have been the success it was.
- The contribution of three new pieces of collection hardware JSTARS, ASARS and the Pioneer UAV.

Referring back to the three categories of intelligence activity with which this paper began, the conclusions are:

- Intelligence *collection* in Operation Desert Storm was generally very good and deserving of praise.
- Intelligence *distribution* overall was very poor, particularly when it came to serving air fighting units. Both the hardware and the people failed.
- Intelligence *analysis* was mixed. The concept was brilliant. But the count of dead Iraqi tanks, APCs and artillery pieces exposed a major systemic failure in the ability to accurate make battle damage assessment.

SCHWARZKOPF CRITIQUES OF INTELLIGENCE

(From Congressional Testimony of June 12, 1991)

OVERALL

I think that as far as the intelligence support and the war as a whole, it was excellent. We had very, very good intelligence support. We had terrific people. We had a lot of capabilities.

(1) ESTIMATES OF ENEMY STRENGTH

I don't feel that we overestimated at all. . . . The ground success occurred after a very, very carefully calculated campaign plan that was designed to reduce the will and capability of the Iraqi military to fight. That's why we succeeded so quickly. It had nothing to do with an overestimation of the number of people who were there.

(2) BATTLE DAMAGE ASSESSMENTS

BDA . . . was one of the major areas of confusion. And I feel that was because there were many people who felt they were in a better position to judge battle damage assessment from a pure analysis of things like photography, and that sort of thing, alone, rather than allowing the theater commander, who is the person that really, in the final analysis, has to make the ultimate assessment to apply good military judgment to what he is seeing. That led to some reports that were confusing. It led to some disagreements. As a matter of fact, it led to some distancing on the part of some agencies from the position of Central Command at the time, as to what the battle damage assessment really was. . . . There were certain very specific trigger points, to use the term, that we felt that we had to arrive at before we could successfully launch the ground campaign. And it was important that we had good analysis of how we were coming, how we were progressing towards those trigger points before we were in a position to recommend to the president of the United States that we do launch a ground campaign. I would tell you very candidly that based upon some of the analysis that we were getting, we'd still be sitting over there waiting if we were dependent upon that analysis because unless it could be seen on a photo as absolutely 100 percent being destroyed, no credit was given for it being destroyed. Pilot reports that came back—no credit was given to them. Sure, they're going to be inflated. We know that. But you don't go out and conduct a complete bombing raid and come back with no results. . . . About a week before the ground attack, I made a statement that the Iraqi military was about to fall apart. And I think the very next day in all the press it said the [redacted] agencies were all distancing themselves from Schwarzkopf's comment that the Iraqi military is about to collapse. [redacted] that. . . . I also facetiously used to kid my J–2 all the time and say, this is really great, you got a four-span bridge, you knock out two complete spans and you're only told that the bridge is 50 percent destroyed. Nothing can go across that bridge, but it's only 50 percent destroyed. I think it's something we need to look at.

(3) RESPONSIVENESS

One of the shortcomings we found is that we just don't have an immediately responsive intelligence capability that will give the theater commander near real time information that he personally needs to make a decision. I guess one of the best examples of that was when General Chuck Horner said to me... in every other war when our pilots were to go out and hit a target, they generally have an aerial photograph in their laps that was no more than 24 hours old of exactly what it was they were going to hit.... We didn't have that capability. And that's what we mean by tactical intelligence. That's real time intelligence that's available to the theater commander or the subordinate commanders for their use.... I think that the intelligence community should be asked to come up with a system that will, in fact, be capable of delivering a real time product to a theater commander when he requests that. It could be aircraft. It could be other capabilities.... I just think that's a void because we focus too much on what might be called national systems which respond more to national directive out of Washington.

(4) INTEROPERABILITY

There is a need to standardize the intelligence connectivity and interoperability between the services. The Air Force and the Navy built their air and electronic orders of battle from different data bases. When you want to transfer the order of battle from one data base to another, it was extremely difficult to do and many times had to be by hand. . . . I think that the passage of intelligence between all the services and also between a headquarters like mine down to the components, and to make sure that we all have the same kind of equipment out there, to both develop it and receive it, is a very important area of interoperability that the services have to work on in the future.

(5) CAVEATIZATION

I personally feel that there's a serious need to develop a standardized methodology within the intelligence community for making estimates and predictive analysis. . . . The analysis we received was unhelpful. And it was unhelpful because it ended up being so caveated. . . . There were so many disclaimers that by the time you got done reading many of the intelligence estimates you received, no matter what happened, they would have been right. And that's not helpful to the guy in the field.

○

ISBN 0-16-0[illegible]3
90000
9 780160 413834